Price One Shilling Net. June, 1918.

THE VETERINARY JOURNAL

A Monthly Review of Veterinary Science.

Editor:
FREDERICK HOBDAY, F.R.C.V.S., F.R.S.E.,
HONORARY VETERINARY SURGEON TO HIS MAJESTY THE KING.
MAJOR IN THE ARMY VETERINARY CORPS.
HONORARY MEMBER OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.
CORRESPONDANT ÉTRANGER DE LA SOCIÉTÉ DE MÉDECINE VÉTÉRINAIRE DU BRABANT (BELGIUM

Sub-Editor:
GLADSTONE MAYALL, M.R.C.V.S.

LONDON
BAILLIÈRE, TINDALL & COX
8, Henrietta Street, Covent Garden, W.C.2.

AGENTS { United States—ALEXANDER EGER, Chicago.
Australasia—GORDON & GOTCH, Melbourne, Sydney, Wellington.
Canada—THE MACMILLAN CO., Toronto.

Entered as Second-Class Matter in the U.S. Post Office.

Issue No. 516. Vol. 74. No. 6.

Results secured in both hospital and private practice have demonstrated to veterinarians that

THE CURE OF

Coughs, Bronchitis, Pneumonia, Laryngitis, &c., in Horses and Dogs

can be effected with greater certainty and promptness by the use of

Glyco-Heroin (Smith)

than by the employment of any other remedy extant.

COUGHS.—Glyco-Heroin (Smith) checks cough instantly, relieves obstruction of the breathing passages, liquefies the mucus, allays the pain, subdues nervousness, abates the fever, and induces restful sleep. Relief is immediate and recovery rapid.

PNEUMONIA.—Glyco-Heroin (Smith) relieves the congestion, disperses engorgement, reduces the fever, sustains heart action, calms nervous excitement, renders respiration free and regular and shortens the duration of the disease. It conserves strength and forestalls the development of fatal complications.

BRONCHITIS.—Glyco-Heroin (Smith) allays inflammation of the bronchial tubes, arrests the cough, begets free breathing, dispels fever, liquefies the bronchial secretions, restores the appetite, and prevents the disease from assuming the chronic form.

LARYNGYTIS.—Glyco-Heroin (Smith) relieves inflammation of the larynx and tenderness of the throat, abates the fever, allays the pain, checks the cough, promotes the appetite, and induces quiet sleep.

DOSE.—The dose for horses and cattle is one ounce every two or three hours. For dogs, ten drops to half-teaspoonful.

SUBSTITUTION.—To ensure entirely satisfactory results, it is vitally important that veterinarians emphasise name "Smith" when purchasing or prescribing Glyco-Heroin (Smith), for many worthless substitutes for the remedy are offered by unscrupulous dealers.

LITERATURE.—Exhaustive clinical reports from the foremost hospitals and members of the veterinary profession will be sent, post paid, on request.

MARTIN H. SMITH COMPANY, NEW YORK.

Sole British Agents—

THOS. CHRISTY & Co., 4, 10 & 12, Old Swan Lane, LONDON, E.C.

FLUID EXTRACTS

Chemically and Physiologically Standardised.

For table of doses and method of dilution for production of corresponding Tinctures, please see our Drug List.

POWDERED DRUGS.

Ground in our own mills and guaranteed absolutely pure.

ANTISTREPTOCOCCIC, TETANIC AND SWINE FEVER SERA, MALLEIN AND TUBERCULIN

From the Pasteur Institute, Paris.

ANTI-BLACKLEG, ALSO ANTI-SUPPURINE AND STREPTOCINE BACTERIAL VACCINES

From the Cutter Company, U.S.A.

Canine Anti-Distemper Serum

(Dr. S. MONCKTON COPEMAN, F.R.S.)

WILLOWS, FRANCIS, BUTLER & THOMPSON, Limited,

WHOLESALE DRUGGISTS.

40, ALDERSGATE STREET, LONDON, E.C.

Telegrams: "FORTY, LONDON." Telephone: CITY 3618 and 3619

I

CONTENTS.

Veterinaire Inspecteur Fray. .. .. *Frontispiece*

EDITORIALS—

Some Seasonal Diseases of War 195

The Necessity for the Proper Care of Horses and Mules during the Present War 196

ORIGINAL COMMUNICATIONS—

Actinomycosis. By Major J. H. TAYLOR, M.C. 198

Notes on Treatment of Ulcerative Lymphangitis. By Capt. A. J. HINES, A.V.C. (T.F.) 199

Sclerostomes as a Cause of Debility. By Capt. HAMILTON KIRK, A.V.C. (T.F.) 202

Pyæmia in a Heifer. By G. MAYALL, M.R.S. 205

Braxy: With Special Reference to the Disease as Seen in North Cardiganshire. By E. MORGAN, M.R.C.V.S. D.V.H. 209

Toxic Enteritis and Constipation in the Dog. By HENRY B. EVE, M.R.C.V.S. 212

Oral Sepsis in the Dog. By HENRY B. EVE, M.R.C.V.S. .. 213

Parasitism: A Resumé. By FRED. C. MAHON, M.R.C.V.S. .. 214

TRANSLATIONS 219

A BOXING COMPETITION "SOMEWHERE IN ITALY" 226

REVIEWS 227

CORRESPONDENCE 229

PERSONAL 229

OBITUARY 229

NOTICES.

All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C.2. Telephone: Gerrard 4646. Telegrams: "Baillière-Rand, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editor.

Manuscript—preferably typewritten—should be on one side only of paper, marked with full name of author.

Illustrations for reproduction should be in good black or dark brown ink on white paper or card.

Advertisements and all business matters relating to the JOURNAL should be addressed to the publishers, Messrs. Baillère, Tindall and Cox.

Annual Subscription for the British Empire, 12s., post free; for the United States $3.00; or combined subscription with the "Veterinary News" (weekly), 25s., post free.

HYDROGEN PEROXIDE SOLUTION (P., D. & Co.)

MADE IN ENGLAND,

retains its germicidal power so much longer than most commercial preparations do, and is of such exceptional purity, that it is recognised all over the world as

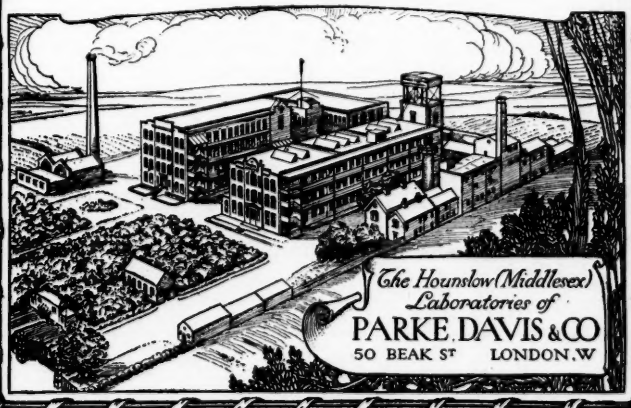
THE MOST RELIABLE AND MOST EFFECTIVE FOR ALL VETERINARY PURPOSES.

"P., D. & Co." HYDROGEN PEROXIDE SOLUTION contains 3% by weight of absolute hydrogen peroxide, corresponding to about 10 volumes of available oxygen, as required by the British Pharmacopœia.

Supplied in bottles of 4, 8, 16 and 80 fluid ounces.

Please specify "P., D. & Co." when ordering.

Prices and literature will be forwarded on request.



Practical Books for Veterinarians

SMYTHE'S Wounds of Animals and their Treatment. Pp xii. + 194, with 30 Plates and Illustrations. Price 6s. net, postage 5d.

"Contains much useful information based on up-to-date knowledge of the treatment of wounds in animals. It is a handy volume which can be commended for its many valuable details of wound treatment."—TROPICAL VETERINARY BULLETIN.

THOMPSON'S Elementary Lectures on Veterinary Science. By H. THOMPSON, M.R.C.V.S. It treats all the ailments of Horses, Cattle, Sheep, Pigs, and Dogs. Fourth Edition Pp. xvi. + 543, with 44 Original Plates and 17 other Illustrations; Price 12s. 6d. net, postage 5d.

SMYTHE'S Veterinary Parasitology. PP. xiv. + 130, with 29 Illustrations. Price 5s. net, postage 4d.

LANDER'S Veterinary Toxicology. Pp. xii. + 314, with 39 Illustrations. Price 7s. 6d. net, postage 5d.

"One of the most welcome volumes that has been presented to the veterinary profession for a long time."—VETERINARY JOURNAL.

REEKS' Common Colics of the Horse : Their Causes, Symptoms Diagnosis and Treatment. Third Edition. Pp. xvi. + 370, with 32 Illustrations. Price 6s. net, postage 4d.

"It may be fully commended to any student or practitioner."—VETERINARY RECORD.

MAYALL'S Cows, Cowhouses, and Milk. Second Edition. Revised and Enlarged. Pp. vii. + 136, with 34 Plates and Illustrations. Price 3s. 6d. net, postage 4d.

WOODRUFF'S Economic Feeding of Horses. Pp. x. + 118. Price 3s. 6d. net, postage 3d.

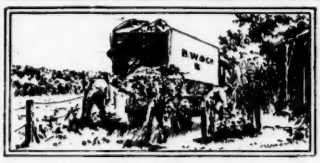
"The object of the work is to explain the principles of feeding, and to show how those principles can be put into practice with economic advantage."—VETERINARY JOURNAL.

BANHAM'S Table of Veterinary Posology and Therapeutics, with Weights Measures, etc., for the use of Students and Practitioners (in accordance with the British Pharmacopœia, 1914). Fourth Edition. Pp. xvi. + 270. Price 4s. net, postage 4d.

BAILLIÈRE, TINDALL & COX

8, HENRIETTA STREET, COVENT GARDEN, LONDON, W.C.2.

Horse-hoeing Belladonna



Carting Belladonna

THE 'WELLCOME' MATERIA MEDICA FARM, ENGLAND

Scientific Veterinary Practice

¶ Rule-of-thumb medicaments were good enough for rule-of-thumb treatment.

¶ Modern scientific treatment demands chemicals and galenicals of definite and unvarying activity.

TRADE MARK **'WELLCOME'** BRAND

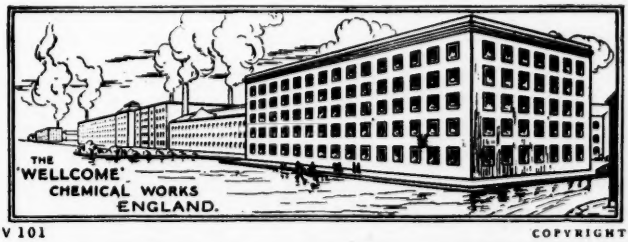
CHEMICALS AND GALENICALS

are scientifically prepared from finest raw material, much of which is cultivated on the 'Wellcome' Materia Medica Farm. The finished products are chemically or physiologically standardised wherever practicable. All conform to the firm's "B.P. or Better" standards.

They are certainties in any scheme of treatment

List on application.

BURROUGHS WELLCOME & CO., LONDON



V 101

COPYRIGHT

PAROPHYROXIA.
(HEWLETT'S)

Since we introduced this invaluable medicine into Veterinary Therapeutics no preparation has commanded such attention in the treatment of Colic with impaction and tympanites in horses. It is now used by most leading veterinarians, and is generally admitted to be the safest and most active of all the remedial agents employed for abdominal pain with impaction.

It possesses three distinctive therapeutic powers—*i.e.*, Antiseptic Purgative and Carminative, and is indicated in all cases of Colitis caused by undigested food, or irritative affections of the alimentary canal, partiy no doubt by removing acrid irritating secretions or foreign materials, neutralising gaseous fluids, depleting the congested blood vessels, and arresting the distended and tympanitic condition of the colon, rendering it the safest and most satisfactory purgative in these cases. It is peculiarly adapted for those cases of Colic so frequently met with in aged horses, who are generally described as "Gross Feeders," where the food is bolted and not sufficiently masticated owing to the teeth being faulty, and where the digestive organs are impaired from a loss of tone in the system, the circulation bad, and the necessary amount of gastric juice is insufficient to digest the food. It is very extensively used in Scotland by numerous practitioners for the Colic caused by coarse feeding which produces impaction with painful contraction of the muscular coat of the bowels accompanied with tympanites.

It is in these cases that Parôphyroxiâ has a very marked effect in reducing the spasm, arresting fermentation, and subduing the drum-like condition of the colon. The large amount of clinical evidence adduced in its favour by various experienced and sound practitioners commends it so strongly that it is now placed at the head of the list of the different agents employed in the general treatment of Colic.

It should be well borne in mind that as the drug is purgative in its action no physic ball or other purgatives should be administered, but if the practitioner deemed it necessary to follow up the treatment with another draught, some simple antispasmodic would not be contra-indicated.

Price 4/6 per lb. W. Quarts 4/3 per lb.

Introduced and Prepared only by

C. J. HEWLETT & SON, Ltd.,

Wholesale & Export Druggists & Surgical Instrument Makers,

35-42, CHARLOTTE ST., & 83-85, CURTAIN RD., LONDON, E.C.2.

KANSAS STATE AGRICULTURAL COLLEGE
18 JUL 1918
LIBRARY

VÉTÉRINAIRE INSPECTEUR FRAY,
FRENCH ARMY VETERINARY SERVICE.

THE

VETERINARY JOURNAL

KANSAS STATE AGRICULTURAL COLLEGE LIBRARY 18 JUL 1918 393160

Editor :

FREDERICK HOBDAY, F.R.C.V.S., F.R.S.E.,

HONORARY VETERINARY SURGEON TO HIS MAJESTY THE KING;
MAJOR IN THE ARMY VETERINARY CORPS.
HONORARY MEMBER OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.
CORRESPONDANT ÉTRANGER DE LA SOCIÉTÉ DE MEDECINE VÉTÉRINAIRE DU BRABANT (BELGIUM).

Sub-Editor :

GLADSTONE MAYALL, M.R.C.V.S.

JUNE, 1918.

Editorials.

SOME SEASONAL DISEASES OF WAR.

ROUGHLY speaking, in order to do the greatest good to the greatest number, the organisers of the Veterinary Hospitals have at least some ten or twelve particular groups or headings of disease to provide for ; and it is astonishing how, just as in civil practice, only to a much more overwhelming extent, these have their seasonal proclivities, and have to be specially catered for in times of stress and pressure.

It has often been observed in daily practice how, if a case of an unusual malady comes along, it is very frequently followed by others, and in the large veterinary hospitals this is quite the rule, for very large portions of the hospitals have to be set aside for a certain class of disease, which presently dies out, and in a week or two the same proportion of hospital wards will be filled up by a totally different set of patients suffering from a totally different type of malady.

Mange, above all others, seems to be a seasonal affair, the greatest rushes being in the late winter and early spring, the non-disturbance of the long coat being a fruitful factor of its undiscovered presence. In the wet and winter months thousands of debility cases are sent down from the Front, and if the winter is very wet and muddy (and France and Flanders seem to be always muddy), the bacillus of necrosis plays havoc with the skin of the coronet and fetlocks. Ulcerative cellulitis, too, is much worse in some districts than in others, whilst periodic

ophthalmia has become such a serious problem that the question of the satisfactory disposal of the large numbers of good young horses which have become blind, and therefore unsuitable for work at the Front, is one which takes a lot of solving. Glanders, thanks to the skilled use of mallein, is no longer feared, and the advances made in the control of this disease have removed one of the biggest enemies to efficiency in the horse units of all armies. That some skilled scientist may discover cures, or diagnostic agents, on similar lines for the other troublesome and serious diseases is the wish and hope of every Army veterinary officer, and indeed of every civil practitioner, too, who has large studs or bodies of horses to deal with.

Above all, we on our part must take every precaution to avoid the admission into Great Britain, after the war, of these diseases which are working such ravages on the Continent, and which are at present an unknown quantity in our country. The Veterinary Sanitary Service will be put to as severe a test then as it has ever had, but it will have behind it the practical experience gained by many hundreds of members of the profession whilst acting as officers in the Army Veterinary Service during this great war.

THE NECESSITY FOR THE PROPER CARE OF HORSES AND MULES DURING THE PRESENT WAR.

In no previous war has the benefit of a properly organised veterinary department been better demonstrated than the present one, and on no previous occasion have the salvage arrangements for dealing with incapacitated animals (whether from wounds or disease) been so complete.

Once a horse or mule gets put out of action it becomes a terrible responsibility and care to the unit to which it belongs, and the fighting units are only too thankful to have the means of evacuating it to a place where it can be properly taken care of; especially as by so doing it has a very high prospect of being again converted into a useful part of the fighting machine.

The Veterinary Corps really becomes a huge salvage corps which, from an economic point of view, deals with tens of thousands of pounds of waste material (for a sick animal always becomes a waste product for the time being) and restores it back to utility and value for the benefit of the tax-payer.

The fighting units at once get rid of the incubus, being thus able to continue their plans unimpeded by the loss of men and time which veterinary attention would necessitate, and the whole machinery of war progresses again. Regular veterinary inspections of the horses

for the prevention of contagious disease and the evacuation of sick to mobile sections, finally to reach veterinary hospitals, have become as essential to the "carrying on" of the army in warfare as is the care of the health of the men. The one could not "carry on" without the other, and those who said that the horse had had his day and was a useless encumbrance and expense during the present struggle, have only to read the accounts which appear from time to time from the war correspondents, in our daily papers, to understand that the horse and mule are even more essential to-day than they were in the wars of our ancestors.

In some of the mountainous fronts, for example, motor traction is impossible, and everything, food and ammunition, has to be taken to the front line trenches on pack animals; and on most fronts, owing to the bad weather and the torn-up state of the roads, nothing can be taken except on pack-saddles to within two or three miles.

A recent extract quoted from the report of Mr. Hamilton Fyfe, the *Daily Mail* correspondent, illustrates well from the sentimental side and the utility side the necessity of skilled veterinary care in the conservation and treatment of the suffering animals. He says: "The horses are having a great deal more work to do than during the trench warfare. How they add to the picturesqueness of war, but how much also to the pitifulness of it, when one sees them, as I have lately, lying by the roadside.

"There was a touching scene a few days ago not far from Moreuil. Some dragoons on the way to hold up the German thrust came under heavy shell fire and a number of horses were wounded. Their riders had to leave them. They could not be left to die in lingering pain, so there was no way for it but to end their sufferings at once. It was hard for the men who loved their patient, gentle mounts, and who had only just been reunited to them after a separation while the troopers were employed as infantry, to shoot their comrades as they lay. Many of them had tears in their eyes; some were seen to turn their heads away as they pulled the trigger. The poor beasts, torn in flank or belly by fragments of shell, turned on their masters with looks of wondering reproach.

"No one who cares for horses could have seen this episode of open warfare without emotion. It passed quickly. There was no disorder. Troopers knew what was necessary to be done, and did it. Then they formed up again, those who had now no horses becoming foot soldiers, and they went on and kept the enemy back, putting all the more ginger into their fight from the thought of their horses which they would never see again.

"Proudly and sturdily go the gun horses, even in the rain. As I

passed a battery to-day, with the officer enveloped in his waterproof riding in front, and the drivers humping their shoulders on their limbers, or in their saddles to keep some of the wet off, I thought how much better off we are for horses than the enemy. He has been using small, Russian ponies for transport work, and we have heard of some German batteries which now have no horses of their own. They have to borrow them from the transport when they move. This does not affect the heavy artillery, which is moved by tractors, and seems to be coming up in large quantities at a steady pace."

That the horse and mule can never be done without, and that there will always be horsed units in every Army, is a certainty, and so long as that is the case we may rest assured that we shall always have an outlet for our professional brethren in the shape of a well-organised and well-equipped Veterinary Corps. The latter can never again fall back to the small unit it was before the war, and considering its phenomenal and rapid growth it reflects the greatest credit on those who were responsible for the original plans and lines upon which it has been run.

Original Communications.

ACTINOMYCOSIS.

By MAJOR J. H. TAYLOR, M.C.,
Army Veterinary Corps.

Subject.—Bay rider, about 12 years old, belonging to Divisional Ammunition Column. This horse had been awkward to manage at times, but showed no inclination for sexual intercourse. He had been sick for about a week, and as he showed no signs of improvement, I was asked by the Veterinary Officer in charge of the unit to consult with him.

Symptoms.—The horse stood in one position, with no inclination to move. Pulse, temperature, and respirations normal. The buccal membrane exhibited sloughing patches and there was a most offensive odour from the mouth. Urine normal in colour, but scanty in quantity, contents of rectum hard and covered with mucus. Entire disinclination for food. Drank a little water linseed gruel. Loss of condition very marked.

Treatment.—Antiseptic mouth wash, mag. sulph. in drinking water, and ammon. carb. balls.

Prognosis.—Very unfavourable, and it was decided to slaughter if the animal got down and was unable to rise. During the night the horse fell down and was destroyed.

Post-mortem.—The *post-mortem* made the next day proved very

interesting, and I think almost unique. Lungs, heart, and liver normal. There was atrophy of the left kidney and hypertrophy of the right kidney, this latter organ being three times its normal size. The right testicle was suspended in the abdomen; its structure had undergone fatty degeneration, but the spermatic cord and epididymis were distinctly discernible. A large growth, fully 28 lb. in weight, involving the mesenteric glands in the region of the kidney, was found. At first sight this was thought to be tuberculous. A portion was, however, sent by me to the O.C. No. 20 Mobile Laboratory, who very kindly made a microscopical examination and reported that it was a case of "Actinomycosis."

The case being so uncommon, a short report may interest the members of the profession.

NOTES ON TREATMENT OF ULCERATIVE LYMPHANGITIS FROM NOVEMBER 18TH, 1917, TO JANUARY 11TH, 1918.

By Capt. A. J. HINES, A.V.C. (T.F.).

Summary of Total Cases Admitted to Hospital.

Cured.	Destroyed.	Died.	Cast.	Remaining.	Total.
595	229	2*	2	572	1,400.

*One of these arrived dead in train.

Cured animals are sent to No. —— Hospital, —— . A certain percentage have, in addition to ulcerative lymphangitis, other diseases, such as mange, ophthalmia, etc. These secondary diseases are treated at No. —— Hospital; but when lymphangitis is cured they are then transferred to No. —— , irrespective of the condition of the other diseases with which they are affected.

Altogether, 634 animals have been discharged from No. —— Hospital to No. —— as cured, but 39 cases have been returned here, having had a recurrence of the lymphangitis.

Animals, previous to December 20th, 1917, had been treated with Preisz-Nocard vaccine or treatment other than by injections. The summary of cases treated up to that date is as follows :—

Up to and including December 20th, 1917—

Cured.	Destroyed.	Died.	Cast.	Remaining.	Total.
383	24	*Nil.*	2	703	1,112

On December 18th, 1917, Captain Watson, C.A.V.C., paid a visit to No. —— Hospital, bringing with him, in addition to Preisz-Nocard vaccine, a supply of prepared pus and serum. He requested that these should be tested against each other. Sixty animals were, therefore, selected and divided into three twenties, each twenty containing a similar number of mild, medium, and advanced cases.

In the case of the animals treated with serum, it was intended after seven days' injection to subdivide this group of twenty into two groups of ten, continuing the daily injections of serum with the one group, and in the case of the other proceeding to vaccine treatment with Preisz-Nocard vaccine. It was, however, found that at the end of seven days the supply of serum was exhausted, so the whole twenty were therefore treated with Preisz-Nocard vaccines.

Group No. 1.—*Serum.*

Cured	9
Doing well; no discharge from ulcers, but requiring a few days for superficial wounds to heal ..	5
Requiring further treatment	3
Doubtful cases, possibly destruction	3

Group No. 2.—*Pus.*

Cured	12
Doing well, but requiring a few days for wounds to heal	2
Requiring further treatment	2
Destroyed	4

Group No. 3.—*Preisz-Nocard Vaccine.*

Cured	8
Doing well, but requiring further time	9
Doubtful case, possibly destruction	1
Destroyed	2

Group No. 1.—Treatment consisted of injecting 15 c.c. of serum daily for seven days, and then proceeding with Preisz-Nocard vaccine, commencing with 2 c.c., and increasing the dose by 1 c.c. each week. Local treatment consisted of well washing with saline solution. Exercise was given whenever possible; but the roads having been so slippery lately, exercise had unfortunately to be abandoned on several days. Remarks as to local treatment and exercise apply to all three groups.

Group No. 2.—In this case treatment commenced with 2 c.c. of prepared pus injected hypodermically in the neck—near-side one week, off-side next week. Each week an injection was given, increasing the dose by 1 c.c. each time.

Group No. 3.—In this case treatment was commenced by giving 1 c.c. or 2 c.c. Preisz-Nocard vaccine hypodermically, and increasing the dose by $\frac{1}{2}$ c.c. or 1 c.c. as thought necessary. One injection was given each week. Polyvalent vaccine was given when thought necessary in doses of 2 or more c.c.

It is certainly not fair to deduce final conclusions at the present

stage of these tests, but the following may be submitted as tentative conclusions based on the progress made up to the present :—

(*a*) No form of treatment in advanced cases with multiple lesions seems to be of any avail.

(*b*) From the above it follows that cases of ulcerative lymphangitis should be submitted to treatment by antibodies in the initial stages of the disease.

(*c*) From the results of the comparative treatments up to the present, that by prepared vaccine seems to be the most effective in, mild uncomplicated cases, as progress is more rapid.

(*d*) The results of the other two groups were about equal, and no very definite conclusion as to their relative merits can be submitted as a result of this experiment. Certain it is, however, that in this particular instance progress was more slow than in the case of the group treated by prepared pus.

SUMMARY OF CASES DESTROYED.

Number of cases sent without any treatment at all a few days after being admitted to hospital	105
Number of cases sent after treatment by other means than vaccine	16
Number of cases sent after treatment by Preisz-Nocard vaccine	87
Number of cases sent after treatment by prepared pus ..	21
Total	229

Many of the cases destroyed after treatment by vaccine were put down a few days after arrival at this hospital, having been treated by the vaccine before arriving here. It is, therefore, submitted that a more uniform standard of condemnation should be aimed at.

February 27th, 1918.—In continuation of the previous report, I am now able to submit the final results of the comparative methods of treatment therein referred to.

Group No. 1.—Serum and Preisz-Nocard Vaccine.	
Cured	17
Destroyed	3
Group No. 2.—Pus Vaccine.	
Cured	14
Destroyed	6
Group No. 3.—Preisz-Nocard Vaccine.	
Cured	15
Destroyed	5

The conclusions which may now be deduced from these groups, comprising comparative methods of treatment as well as from observations of a large number of cases treated, are as follow :—

1. *Treatment by Pus Vaccine.*—Very successful and rapid in action in mild, uncomplicated cases. In moderate and advanced cases it does not, however, meet with the same measure of success. From this, one would infer that the limit up to which the stimulation of Preisz-Nocard antibodies can be carried by this means is rather a low one.

2. *Treatment by Preisz-Nocard Vaccine.*—Favourable results by this method are obtained more slowly, but with greater certainty, than with the preceding, particularly with moderate and advanced cases. Unfortunately the supply of Preisz-Nocard vaccine has not been nearly so plentiful as that of pus vaccine, and treatment by this method, on a large scale, has perforce had to be abandoned for the time being.

3. *Treatment by the combined method of Anti-Preisz-Nocard Serum and Vaccine.*—The final results of these group tests serve to demonstrate that the best results were obtained by this method. The success of this method is particularly noticeable in the more advanced cases. Progress was, however, markedly slower than with either of the other methods. Possibly this may be associated with the fact that no actively immunising bodies (vaccine) were administered until the animal had been under treatment by passively immunising agents (serum) for a period of seven days, so that practically the other methods of treatment had a week's start. One considerable drawback to this method from the practical point are the time and labour entailed in its daily application. This is particularly the case where a large number of animals is to be treated.

SCLEROSTOMES AS A CAUSE OF DEBILITY.

By Captain HAMILTON KIRK,
A.V.C. T.F.

The existence of a comparatively high percentage of cases of debility and emaciation among Army horses and mules leads me to believe that there is some sinister hidden agent at work of which we know little, or, knowing it, consider it of no consequence. Of cases occurring in France, one would perhaps be perfectly correct in assuming that they were directly caused by hard work, exposure, mud, and sometimes unavoidable irregularity in feeding and watering. These causes, however, can hardly be said to obtain at home, and yet we know that debility cases still occur, and in considerable numbers. Having no access to any statistics on the subject, but relying merely on my observations in veterinary hospitals and units in the field, I

know that the mortality among horses during the war, due primarily to debility, must have been colossal. Some argue that the majority of such horses do not die actually of debility, but of some complication such as pneumonia. To this I would answer that the pneumobacillus would never have got a firm hold had it not been for the animal's previous lowered vitality. In the case of mange patients, the opinion is often advanced that mange is the cause of the emaciation, and in reply I would ask: "Is it not conceivable that a horse already having become poor falls a readier prey to mange?" The stereotyped teaching I know is to the effect that acariasis is directly the cause of a loss of condition, and while agreeing with this, I also hold that the reverse may be equally true. Supposing then that my view is correct, and that emaciation is the primary disease which is so readily followed by more serious complications, and frequently death, what is the cause of the emaciation? I consider it is verminous infection of the alimentary canal, and in advancing this view I make no claim to originality, for as far back as 1916 I remember a letter which was circulated to A.V.C. officers to the effect that all *post-mortems* held on animals which had died or had been destroyed for debility were to be conducted with a view to finding the ætiology, and that particular care was to be exercised in the search for intestinal or gastric ulcers. In consequence I have paid greater attention to the subject, and in some cases have discovered small petechiæ or ulcers, or both, and usually associated with the presence of sclerostomes. In practically every case in which I have found sclerostomes on *post-mortem* in the fæces, or attached to the mucus membrane, the horses have in life been "bad doers," or they were positive debility cases. Some veterinary officers have expressed it as their opinion that these worms do no appreciable damage, but I am quite convinced they do. Just before I left France, a certain light draught horse died in the early hours one morning, having been up the line with rations the previous night. By the time I arrived to make my autopsy, the veterinary sergeant had removed the skin and made an incision down the median line of the abdomen. Upon exposing the viscera, a perforation of the large colon could at once be seen, which the Transport Officer mistook for a bullet wound. In the absence of any hole in the skin or muscles, however, this was negatived, and I had the bowels removed, this disclosing two other perforations, one in the large and one in the small intestine. Round each of these holes was a black ring of inflamed and necrosed tissue, measuring roughly 1½ inches across, and prior to the perforation these centres had without doubt been ulcers. I searched for their cause, but could find nothing except hundreds of sclerostomes, which may, or may not, have been

the origin of the trouble. I was strongly suspicious, however, and finally concluded that it was the inflammation set up by these parasites which caused the ulcers, and ultimately perforation, peritonitis, and death. The ascertained history of this horse was to the effect that no untoward symptom of any kind had been noticed prior to death, with the sole exception that he was a "bad doer." In a veterinary hospital in France I many times found these parasites in the alimentary tracts of dead debility horses, though at that time I had not thought so seriously of it as I do now.

Just recently I have passed a period of temporary duty at a mange hospital in the Aldershot Command, and at the time I was there perhaps 80 per cent. of the cases were also debilitated. Many were extremely thin, and on a particular occasion an 8-year-old mule got down, and owing to excessive weakness and partial paralysis of the hind quarters was ultimately destroyed. I made a *post-mortem* and discovered four distinct types of worm: (1) Filaria Papillosa (5 inches long), which is uncommonly met with free in the intestine; (2) Sclerostomum Equinum; (3) S. Tetracanthum; and (4) a small un-named grub-like parasite about ⅛ inch long. The sclerostomes were everywhere in abundance, and in this particular case were nearly all copulating, and found attached to each other at the caudal extremity. At another veterinary hospital where there had been many deaths which upon *post-mortem* had been recorded as due to "parasitic enteritis, accompanied by marasmus," the presence of sclerostomes was everywhere manifest, and no *post-mortem* held upon any animal which had suffered from debility and emaciation could fail to reveal them either in scores or in tens of thousands. In a great many cases aneurisms of the mesenteric and colic arteries were found, in various stages of development, and always containing several sclerostomes. One aneurism, which had been preserved, had assumed the size and shape of a sheep's heart, and in a rare instance I knew of one attaining the size of a horse's heart. Small ones, however, were very common, and undoubtedly gave rise to many of the cases of colic with which we were troubled, and which prior to *post-mortem* could not be accounted for. Some outstanding symptoms may be noted in horses affected with sclerostomiasis, and these are: Arching of the back and loins; capacious appetite; signs of paraplegia, or perhaps only stiffness of the hind legs; varying stages of emaciation from slight to extreme; occasionally a rise in temperature up to about 103°, and sometimes (but in my experience only rarely) constipation alternating with diarrhœa. In cases where these parasites have set up an aneurism complicated by the formation of one or more emboli, there will be frequent attacks of colic, each usually of short duration.

Yesterday I held a *post-mortem* on a horse which had shown all these symptoms, and the large colon presented a sight which, had it been described to me without visual confirmation, I would never have believed. The ingesta within it was a writhing mass of sclerostomes, and in some places there were solid conglomerations of the size of an orange, entirely composed of these worms. An egg-sized aneurism was also present in the great mesenteric artery, and it needs no second thought to realise that the presence of the aneurism and its clot in this situation reduces the calibre of the above artery, and so diminishes the supply of blood to the intestine, which is sufficient to explain the chronic indigestion observed. It is, therefore, conclusively proved that these sclerostomes are the cause of great havoc and loss among equines, and deserve the closest investigation both as to their origin and the means of eradication. I have tried many of the most favoured anthelmintics, but cannot claim as yet to have discovered any reliable cure.

KANSAS STATE AGRICULTURAL COLLEGE 18 JUL 1918 LIBRARY

PYÆMIA IN A HEIFER.

By G. MAYALL, M.R.C.V.S.

Was called to a heifer on March 11th that had had a rough time at calving three days previously, and was now straining repeatedly, but not continuously. The subject had cleansed, but on opening the lips of the vulva and examining the vagina I found it to be torn on each side about 4 inches in, and pieces of necrotic tissue lodged in the wounds. Cleansed the areas well with creolin solution, and, using a mercuric chloride bougie as a caustic stick, inserted it well into the depths of the wounds on each side and dusted the vagina with plasmul powder. Left mercuric iodide solution to inject in the wounds, and also the bougie, and gave the cow a draught of 1 ounce of elixir Kugloid co. (beechwood creosote, quinine, eucalyptol, syr. glyco. phosph. co.) in a pint of water. Five doses of the elixir were left, and the farmer was instructed to insert the bougie into the wounds and inject and dress them twice daily. On March 13 the wounds in shape were looking better, and healing, but heifer had a dry muzzle, a temperature of 103, and was not eating or drinking well, and still straining occasionally, which I attributed to the soreness and irritation in the vagina.

On March 18th an abscess formed just above the off stifle, which I lanced and let out about ½ pint of creamy pus, and injected with a solution of iodophenate of mercury and zinc (eophan tablets, Willows and Co.), and also the wounds in the vagina. Left another course of the elixir Kugloid, as I was anxious to avoid further pus formation. Heifer seemed better in herself, did not strain much, and was eating

and drinking a little. Ordered regular and thorough injection of lesions with the mercury and zinc solution.

On March 25th the abscess cavity and wounds were doing well, and the animal had been out on a grass field during the sunny hours of the day. I left some more internal antiseptic medicine.

On March 30th another abscess formed on the outside of the right lip of the vulva. I lanced and injected it and on April 5 the heifer was going out regularly when fine and seemed in a fair way to complete recovery.

I am recording this case because pyæmia is not now of very frequent occurrence in our patients, and most authorities agree that it is generally fatal when it occurs. Complete and methodical disinfection seems to give the only hope for favourable results, and at the same time a good intestinal and general antiseptic is advisable. Merillat in his "Principles of Veterinary Surgery," Vol. II, gives Bouley's view that the following is the order of frequency of pyæmia in the domestic species:—(1) fowl, (2) oxen, (3) dogs, (4) swine, (5) sheep, (6) rabbits, (7) horses.

BRAXY: WITH SPECIAL REFERENCE TO THE DISEASE AS SEEN IN NORTH CARDIGANSHIRE.

By E. MORGAN, M.R.C.V.S., D.V.H.

(*Concluded from May issue.*)

We have even succeeded, by this means, in saving all our best wether lambs. We fed them for three successive seasons with maize and swedes, on fields where braxy used to be rife. During the entire period, only one lamb suffered from braxy, and this was found to be in the first stages of the disease, as he had taken some food a few hours before. We killed the lamb and he bled moderately well, though the blood from an animal suffering from braxy does not spurt out, but runs in a slow, continuous stream, as if from a vein. In this case we found the skin and flesh as the "Book of Husbandry" said: "Far ruddier like blud, more than other skin should be," proving how quickly the disease runs through the system, as evidently the lamb could not have been feeling much pain as he was able to take food only four hours previously.

Why the best conditioned lambs suffer more than those in a poor condition is difficult to account for satisfactorily; maybe the plethoric state of the animal has something to do with it. According to McCann, it is definitely known that the specific gravity of the blood can be changed at will through the instrumentality of diet, and that, furthermore, minerally deficient food affects, with extraordinary rapidity, the specific gravity of all the internal secretions. Normally fed animals in whose diet appear the salts and colloids of calcium

potassium, iron, phosphorus, manganese, magnesium, sodium, sulphur, silicon, chlorine, fluorine, and iodine, are able to develop immunity to many diseases. We are quite certain that all forms of malignant diseases are only possible in the absence of, or loss of, immunity. The extent to which natural immunity depends upon the specific gravity of the blood has never been sufficiently realised.

Meadowland with abundance of moss should be avoided, as feeding lambs on moss is something like those people who used to destroy their neighbours' dogs by means of a piece of sponge soaked in dripping, or hot liquid fat, either of which contracts the sponge; when this enters the stomach and the fat is absorbed into the system the sponge expands—the result being obvious.

Braxy is more prevalent on land low down in the valley, and land bordering on marshes, than on dry tableland up the hill, and it is an interesting fact that old sheep always direct their footsteps towards the highest point of the farm at evenfall, and they are still more eager to do so should the land below be marshy or wet.

There is a vast difference between the temperature in winter down in the lower ground and that higher up the hill, cold air naturally falling, while hot air rises, as instanced by the fact that hoar frost lasts longer down in the glen than higher up on the hill. Again, no one would place outlet ventilators for hot air on the floor of a building! When sheep are seen making for the higher ground they are, as a rule, in good health; but if they stay down in the valley overnight without showing inclination to move upwards to rest, a lack of vitality is indicated. This is one reason why it is advantageous to allow the lambs to follow the ewes; the old sheep know better, and are therefore able to train the young. The farmers on the high hills—where the bulk of the flock has to face heavy snowstorms, with hardly any shelter whatever, except an odd rock here and there—keep their wethers until they are about four years old. One reason, amongst others, given for doing so, is that they act as guides to the rest of the flock. During the heavy snowstorms (which generally appear one winter in every six) they lead them out in search of food, and not only lead them out, but actually scrape up the snow until they reach the tips of a few rushes or some heather. Were it not for this intelligent help, the younger flock would probably starve to death down in the valley. Homer compares Ulysses drawing his men to a ram ordering his flock —

> From rank to rank he moves and orders all;
> A stately ram thus measures o'er the ground
> And, master of the flock, surveys them round."
>
> (POPE'S TRANSLATION.)

Shelter at Night as a Preventive of Braxy.—Where braxy occurs, it is advantageous to give lambs shelter. The open air is preferable to housing, as the lambs will feel the bitter cold upon being turned out of a warm building in the morning. In Germany, where they always house the sheep at night, it is said that the percentage of deaths is very high from a disease they call braxy. I am rather doubtful as to whether this is identical with the beaxy of Scotland and Wales, because old sheep as well as young ones suffer from it. But whatever the disease, it probably accounts to a great extent for the rapid decrease in the number of sheep in Germany between 1892 and 1913, when the numbers fell from 13,600,000 to 5,500,000, i.e., a decrease of 60 per cent. in twenty-one years. In Great Britain a decline is also observable between the years 1909 and 1913, the number of sheep decreasing from 31,840,000 to more or less 28,000,000. This decline is unsatisfactory, but it appears trivial when compared with that of Germany, more especially when we remember that the United Kingdom has been for many years the breeding ground for pure-bred sheep.

In Montgomeryshire, anyone interested in sheep may see the nearest approach to perfection of any country in the matter of management and breeding to type. They appear to have been gifted almost like the patriarch Jacob in successfully mating their sheep so that the progeny will have the desired markings on the face, either "ring-straked," "speckled" or "spotted." In certain braxy areas they provide autumn shelter for the lambs along hedgerows, etc. They also place galvanised iron sheets with ferns or straw above and below them, wherever the lambs are accustomed to rest at night.

A few years ago we had a flock of wether lambs grazing on some fields where we always lost a great number from braxy. These lambs were in extra good condition that particular season, as they were intended from the first for the butcher. They acquired a habit of going every evening to rest in an adjoining plantation where spruce, larch, and other trees were in abundance and under the spreading branches of which they sheltered. But one night, being disturbed by dogs, they spent the remainder of it on some marshy land near by, where we found them next morning. One of their number was dead—the only one of the lot which died that season. I could give several more instances to prove that shelter is advantageous for lambs. The ancients were most careful in providing night shelter for their flocks. Polyphemus is represented by Homer as driving his flocks at eve to his rude cote—a rocky cave. Virgil, lib. XI., describes the cote as designed to "fend" the bitter cold and prevent the diseases produced by it :—

" Frost with assiduous care from winter keep,
Well foddered in the stalls the tender sheep ;
Then spread with straw the bedding of thy fold,
With fern beneath to fend the bitter cold,
That free from gout thou may'st preserve thy care,
And clear from scabs produced by *freezing* air."

DRYDEN.

There are certain farmers in Montgomeryshire who believe that gentle exercise in the early morning is a preventive of braxy, and so they travel their lambs along the road for a few miles every morning. I state this in order to show what pains they take in that country to keep their flocks in good health.

The Pig-dung Treatment as a Preventive.—This is one of the oldest and most universal preventives. In case someone of new experience would care to give it a trial, the method is as follows :—" Feed one or more pigs—store pigs for preference—on pasture where braxy was prevalent the previous season ; give them, as well, skimmed milk *ad lib.* After they have fed here for three or four days, collect the dung. One pound is ample for thirty lambs. Mix it well in two quarts of fresh milk ; strain the extract through a cheese cloth and squeeze it well, so as to secure all the liquid. Divide this proportionately between thirty lambs, after having starved the lambs for at least twelve hours previously. Drench them again in the early morning, and keep them in for two hours after doing so. This should be done about the middle of September, before the braxy season commences. Turpentine is also held by many farmers to be a good remedy. Either administer half a teaspoonful mixed with a little milk, or oil, and drench, or apply a small quantity externally over the loins, above the kidney. Remember, though, that the latter treatment causes the animal a good deal of pain for a while. Bleeding by cutting the tips of the tails in November is practised by some.

As I am unable, as I intended, to go into details with regard to either the symptoms of the disease or the bacteriological side, I must content myself with only mentioning a few points.

Symptoms.—The lamb moves uneasily about the field and lies down ; then gets up suddenly. He may do this amongst the rest of the flock, but later on he withdraws himself to a quiet corner of the field, and although he does not seem to be so uneasy, yet the pain increases, as one can easily tell by the expression of the eyes, etc. He is now undoubtedly in a high state of fever, and the internal pains, together with the fever, are rapidly intoxicating the system. The temperature, as a rule, is about 107° F. There may be a discharge of froth or saliva, and this is seen hanging from the mouth, and some-

times before death it may even be tinged with blood ; often, too, there is a distention of the abdomen during this last stage. Eventually the lamb turns on one side and expires. This succession of symptoms lasts from six, and sometimes up to twelve, hours.

Post-Mortem.—As a result of the large quantity of gas which has been formed, the carcase soon swells up. There is a discharge of blood-coloured froth from the mouth and nostrils ; the legs are stretched well apart, owing to the distention of the body by gases, and the least pressure sometimes causes these gases to burst through the abdominal wall. Here one should remember an advice :—" To thine own nose be true, and it must follow, as the night the day, thou canst not then be false to inner man." It is said that the sense of smell deteriorates as civilisation advances. We hardly ever make use of this organ in order to describe a disease—at any rate, we do not make the use we should do. Kipling declares that the most vivid and lasting memories the world traveller brings back with him are the characteristic smells of the different countries visited, such as " Camel, pure camel, one whiff of which is all Arabia," and " Them spicy garlic smells " of Mandalay ; while Sir Ernest Shackleton supports him and says : " China conjures up in my mind the smell of moth-eaten centuries." Once one gets a whiff of a braxy carcase, the characteristic odour—difficult to describe—is unforgettable. Professor Hamilton once said : " Could you imagine an odour composed of sour beer, stale fish, and decomposing urine, the compound would give you some idea of what braxy odour is like ! " But to return to what we find on making a post mortem. There are several hæmorrhages in various parts of the body, such as the fourth stomach and surface of the heart ; the lungs are congested ; the liver and kidneys are soft and pliable ; the abdomen contains a large quantity of blood-stained serous fluid, hence the name " red-water." Furthermore, the veins (especially the subcutaneous ones) are distended with dark-coloured blood ; the skin is reddish in colour, still retaining this hue even when dried up. Finally, putrefaction soon sets in.

Bacteriology.—A rod-shaped bacillus, discovered by Ivar Nielsen, a Norwegian, has been put down, until recently, as the causal organism of braxy ; Professor Hamilton and others also concurred in this opinion. This bacillus is known as " Bacillus Gastromycosis ovis," and the organisms are discovered in abundance in the internal organs and in the peritoneal fluid. If the carcase has only been dead for a few hours, myriads of these will be found in all its tissues. It belongs to the class of putrefactive organisms, and undoubtedly this *is* a putrefactive organism.

Dr. McGowan, of Edinburgh, has discovered another class of

organisms which he calls the "Bacillus bipolaris septicus oviam"; this he found at first in the lungs. He claims that this organism is *the* causal organism of braxy, and that that described by the Braxy Committee is of a putrefactive nature, and has been superadded to the essential causal factor of the disease. He further states that the lung in which this hæmorrhagic septicæmia organism occurs in largest amount has not been subjected to investigation by them. He claims that this organism is the primary causal, and that hoar-frost, rank grass, etc., are secondary causes which lower the vitality of the animal and allow the bacillus bipolaris septicus to gain an entrance to its tissue. He has cultivated this organism, inoculated sheep from the culture, and caused the same disease. One animal died in about eight hours, another in about fifteen hours, and a third in less than forty-eight hours. This is a most interesting and important point and goes far to prove that Dr. McGowan has strong claims for this being the causal organism. It reminds me of the lamb which took its feed in the morning and which four hours or so later I found far advanced with the disease. Besides this case, I have mentioned others where the lambs were apparently quite well late in the evening, and yet were found to be dead early the next morning, some of them being actually stiff and hard. It is interesting to note that Professor Hamilton gave the incubation period of the organism upon which he was working—Neilsen's organism—as between forty-eight and sixty hours. These investigations make us hope of seeing a vaccine prepared from the causal organism, so that we can protect the lambs during the dangerous period against the disease.

"So let us not think, but try."

Acknowledgments.—I am indebted to Professor Beattie, of Liverpool University, for valuable information regarding this disease, and to Dr. McGowan, of Edinburgh. My thanks are also due to Mr. Jenkin Lloyd, of Pant, Tregaron, for valuable information.

PTOMAINE POISONING IN THE DOG.

By G. MAYALL, M.R.C.V.S.

An Airedale dog scratched up and devoured part of the offal of a bullock that had carelessly been thrown over a hedge by a gardener and partially dug into the earth. In a few hours he was violently sick, and a little later on diarrhœa set in and was very persistent. When I saw him he seemed fairly strong on his legs and able to get about, but had been vomiting and was evidently suffering from diarrhœa. I prescribed elixir Kugloid co. in drachm doses; also I ordered dry food and limited liquid to ½ pint a day. On visiting the dog six days later he was still suffering from diarrhœa, and had

vomited three times since I saw him previously. I prescribed a mixture of bismuth and salol, and teaspoonful doses of sac. lact. dry on the tongue night and morning. I also advised the giving of ten or a dozen arrowroot biscuits daily.

Five days later the dog had improved, but the diarrhœa had not entirely ceased. I prescribed a mixture of bismuth, bicarbonate of soda and chlorodyne, and he seems now on the high road to complete recovery. I have never known diarrhœa to persist so long in the dog without producing absolute prostration, which did not occur in this case.

TOXIC ENTERITIS AND CONSTIPATION IN THE DOG.

By HENRY B. EVE, M.R.C.V.S.,
Folkestone.

Subject.—Fox-terrier (property of a rat-catcher, a very cunning know-all dog doctor and dealer), age about five years, a sportsman and well-known fighter with other dogs.

History.—Dog noticed to vomit continually and pass pultaceous, blood-tinged fæces. Owner had given him a pill of calomel and opium, which had not worked, so gave castor oil and buckthorn, which only produced blood-stained fæces, and he thought the dog would die, which seemed probable.

Symptoms.—Subject seemed very dull, listless; conjunctiva injected; pulse weak, and temperature 104° F.; lay about disconsolate, and refused all food. The breath was very offensive owing to the fœtid condition of the mouth, which was infested with tartar. Great thirst present.

Treatment.—Injected up the rectum, sodium chloride pure (tablet) 15¾ grs. (Parke, Davis and Co.) dissolved in four imperial fluid ounces of water, which the animal held for about ten minutes or so (owner held his hind legs up, and allowed his fore-feet on the ground), when the dog vomited greenish slime and débris, I guess, derived from dustbins, judging by the stink. I then waited about ½ hour and re-injected (Na.cl.), which was followed by clear vomit and no smell. The dog seemed very weak, so I gave him hypo.inj., ether and brandy, as I feared collapse. I sprayed the mouth, etc., with hydrogen-peroxide. I gave owner some pure-medicinal liquid paraffin to take home and give a teaspoonful ere he went to sleep, which was kept down.

Diet.—Nutrient suppositories only for 24 hours. Next day I saw it; patient very weak and prostrate, temperature down to 101° F., but brighter. Continued paraffin treatment. I gave Brand's essence, and glasco by the mouth, which it drank readily, being very thirsty. Next day dog passed soft fæces, no blood, and voluntarily took food (fluid nourishment only allowed).

Result.—The dog recovered in about 10 days, to the owner's delight, and is as game as ever. I am still giving occasional doses of paraffin to regulate the bowels, and have restricted his diet to semi-solid food.

Remarks.—I have had cases in Yorkshires, Aberdeens and Airedales, and have found this treatment give the best results up to date with no casualties. I intend to continue it, as it is inexpensive from a drug point of view, and preferable to other medicines I have tried—often with fatal results. This treatment I adopted from seeing the article by Mr. G. Mayall, M.R.C.V.S., in VETERINARY JOURNAL, some time ago. I am very grateful to him for publishing his treatment of such cases, as now they are no bugbear at all; in fact I welcome them, and will record future results.

P.S.—I have found liquid paraffin in milk excellent for cattle coughing, when suspecting incipient tuberculosis.

ORAL SEPSIS IN THE DOG.

By HENRY B. EVE, M.R.C.V.S.,
Folkestone.

Notes on Cases.—Fœtid breath or oral sepsis is in my opinion undoubtedly bacterial in origin, and usually accompanied by a general or systemic disturbance or a local irritation. Saliva is not apparently a bactericide. When due to local causes such as Pyorrhoea, septic alveolitis or periostitis, impaction of deciduous teeth, loosened teeth or foreign bodies, it ceases as soon as the cause is removed by extraction, even without any ante or post operative treatment. When simply due to the accumulation of debris of food, cleaning with a tooth brush containing a little antiseptic tooth powder or mouth wash generally will do away with the smell. The worst cases I have met with of "oral sepsis or gangrenous stomatitis," I find, are generally seasonal complaints and often occur in an epizootic form in the dog and cat. In its epizootic form it is apparently always a clinical form of distemper or canine typhus (Stuttgart disease) and very fatal and difficult to treat, as sooner or later symptoms of "acute specific gastro-enteritis" develop, and the dog dies, or if it recovers the condition of sepsis disappears when the animal regains its general health.

Prevention, Treatment and Diet.—Oral sepsis or other septic mouth trouble can be prevented in a great measure by dog owners giving suitable food; tearing raw meat from bones, I suggest, is the best, it being a carnivorous animal, and not soft, pappy starchy food, or dog biscuit mealies, which are a frequent cause of eczema.

Medicinal.—If tartar present, I clean the teeth with a little powdered pumice-stone, and then spray the gums, mouth, etc., with hydrogen-peroxide, which will bleach the teeth, and if any smell, I use a pre-

paration of Eau-de-Cologne, myrrh, benzoin and boric acid, Peru balsam in emulsion. Internally, I have found pepsine and hydrochloric acid given in the food very good as a tonic. If intestinal complication is present, I have had fairly good results with capsules of betanapthol and salol, which appears to disinfect the whole of the intestinal tract. Also nutrient suppositories and ice to such, or in pills put down the throat, and diffusive stimulants if necessary to prevent syncope.

Remarks.—In cases I have made a post mortem on, I have generally found structural disease of the kidney, stomach and intestines, accompanied by bacterial necrosis of liver, which seems to be the basis of the trouble. I have not seen ulcerative stomatitis in absolutely toothless dogs as yet.

PARASITISM. A RÉSUMÉ.

By FRED. C. MAHON, M.R.C.V.S.,
Chiswick, W.

"Read not to contradict and confute, nor to believe and take for granted, nor to find talk and discourse, but to weigh and consider."—*Bacon.*

As many contributors to the Veterinary Periodicals, at one time or another, furnish their emanations with a text, I deem it worthy of the occasion to quote Bacon, and trust the rules he inculcated will be applied to myself on this occasion.

I have selected a study of Parasitism, and my essay embraces the condensed information extant, so far as I have gone. The subject is one of great importance from a national as well as a scientific point of view. Slowly but surely neglected subjects, relegated to a musty corner, assume under varying conditions a phase for serious consideration and of especial significance. The future calling of the Veterinarian, the meat inspector, the medical practitioner, alone and in conjunction with the veterinarian, will doubtless be wrapped up in a study of Parasitism.

I.—Natural Protection against Parasitism.

The living organism is a rich storehouse of the very materials from which parasites, both animal and vegetable, can best derive their nourishment. Some means is necessary, therefore, to protect the one from the encroachments of the other.

A plant or animal in perfect health is more resistant to parasitical invasions than one which is ill-nourished and weakly. Of a number of plants growing side by side, those which become infected with moulds are the most weakly, and an animal in low health is more subject to contagious disease than one which is robust. Each organism possesses within itself the means of protection against its parasitical

enemies, and these properties are more in evidence when the organism is in perfect health than when it is debilitated.

One chief means employed by Nature in accomplishing this object is the investment of those parts of the organism likely to be attacked with an armour-like covering of epidermis, periderm, bark, etc.

The grape is proof against the inroads of the yeast plant so long as the husk is intact, but on the husk being injured, the yeast plant finds its way into the interior, and sets up vinous fermentation of the sugar.

The larch remains free from parasitism so long as its covering is intact, but as soon as this is punctured by insects, or its continuity interfered with by cracks or fissures, the Peziza penetrates, and before long the destruction of the branch begins to be accomplished.

So long also as the epidermis of animals remains sound, disease germs may come in contact with it almost with impunity, but immediately on its being fissured or a larger wound made through it the underlying parts, the blood, and soft tissues are attacked by them.

A very remarkable instance of an acquired means of protecting a wound against parasitic invasion is to be found in granulations. Should these remain broken, they constitute a natural barrier to the penetration of most pathogenic, and other forms of germ-life, into the parts beneath. Bacteria of various kinds which alight upon their surfaces begin to fructify in abundance, but are rapidly destroyed, as they burrow deeply. This is accomplished by a two-fold agency for (1) while numbers of them are seized upon by the granulation phagocytes, others are broken up and dissolved by the liquid filling the granulation interspaces (Atanasieff). (2) The latter or histolytic property is not confined to the liquid of granulations; normal blood-serum possesses it to a certain extent. Jürgelünas makes out that when an animal is rendered immune to a particular micro-organism this histolytic property becomes exalted.

II.—Effect of Parasitism on Hosts.

The intensity of the effect of Parasitism on the hosts of the parasite ranges from the slightest local injury to complete destruction. All animals and plants harbour a number of parasites; the range of the direct effect of parasites is seen to be greater. It is probable that in a majority of cases the tissues of animals and plants resist the entrance of microbes, unless there is some abrasion or wound.

In the case of plants, the actual local damage caused by animal or vegetable ectoparasites may be insignificant, but the wounds afford a ready entrance to the spores or hyphæ of destructive endoparasites. So also in the case of animals it is probable that few

microbes can enter the skin or penetrate the walls of the alimentary canal, if these be undamaged.

But as knowledge advances the indirect effect of parasites is seen to be of more and more importance. Through the wounds caused by biting insects the microbes of various skin diseases and inflammations may gain entrance subsequently, or insects may themselves be the carriers of dangerous endoparasites, as in the case of mosquitoes and malaria, fleas and plague, tsetse-fly and sleeping-sickness.

Similarly the wounds caused by small internal worms may be in themselves trifling, but afford a means of entrance for microbes. It has been shown for instance that there is an association between appendicitis and the presence of small Nematodes. The latter wound the cæcum, and allow the microbes to set up the subsequent inflammation to reach their nidus. It has been suggested that the presence of similar wounding parasites precedes tuberculous infection of the gut.

The parasites may cause direct mechanical injury, which is greatly aggravated where active production takes place on, or in, the host, with larval migrations. A tangled mass of ascarid worms may occlude the gut. Masses of eggs, larvæ, or adults may block the blood-vessels, or cause pressure on important nerves. The irritation caused by the microbes or the secretions of the parasites may set up a reaction in the tissues of the host leading to abnormal growths (*e.g.* galls and pearls) or hypertrophies.

Migration of the parasites or larvae may cause serious or fatal damage. The abstraction of food substances from the tissues of the host may be insignificant even if the parasites are numerous, but it is notable that, in many cases, the effect is not merely that of causing an extra drain on the food supply of the hosts which might be met by increased appetite. The action is purely selective: particular substances, as glycogenare, absorbed in quantities, or particular organs are especially attacked, with a consequent overthrow of the metabolic balance.

Serious anæmia, out of all proportion to the mass of parasites present, is frequently produced, and the hosts become weak and fail to thrive. Finally, the attacks of parasites have led to the development by the hosts of a great series of protective mechanisms. Such adaptations range from the presence of thickened cuticle, with hairs or spines, the discharge of waxy, sticky, or slimy secretions, to the most elaborate relations of the tissues of the host to the toxins liberated by the parasites.

A. Giard has worked out the special case which he designated as "Parasitic Castration" and shown to be frequent amongst animal hosts. Sometimes by direct attack on the principal sexual organs

and sometimes by secondary disturbances of metabolism, the presence of the parasites retards or inhibits sexual maturity, with the result that the secondary sexual characters fail to appear. The more usual and serious effect on the hosts of parasites is, however, due to the toxins liberated by them.

III. Effect of Parasitism on Parasites.

The phenomena of Parasitism occur so generally in the animal and vegetable kingdoms, and are repeated in degrees so varying, that no categorical statements can be laid down as to the effects produced on the organisms concerned.

All living creatures have a certain degree of correspondence with the conditions of their environment, and Parasitism is only a special case of such adaptation. The widest generalisation that can be made regarding it is that Parasitism tends towards a rigid adaptation to a relatively limited and stable environment, whilst free life tends towards a looser correspondence with a more varying environment. The ***summum bonum*** of a parasite is to reach and maintain existence in the limited conditions afforded by its host. The goal of the free-living organism is a varying or experimental fitness for varying surrounding conditions. And if the metaphor is continued, the danger of Parasitism for the parasite, is that it it becomes too nicely adjusted to the special conditions of its host, and fails to attain these, it will invariably perish.

The degeneration of parasites is merely a more precise adaptation; in the favourable environment, the degenerate or specialised parasite is best equipped for successful existence, but the smallest change of environment is fatal. Such a generalisation as has been formulated covers nearly all the peculiarities of Parasitism. Organs of prehension are notably developed; parasitic plants have twisting stems, boring, roots and special clinging organs; parasitic animals display hooks, suckers, and boring apparatus.

The normal organs of locomotion tend to disappear, whether these be wings or walking legs. Organs of sense, the chief purpose of which is to make animals react quickly to changes in the environment, become degenerate in proportion to the changes which the parasite may have to encounter and are diminished. The changes correlated with nutrition equally conform with the generalisation. The animal has no longer to seek its food, and the lithe segmentation of a body adapted for locomotion becomes replaced by a squat or insinuating form.

Jaws give place to suckers and piercing tubes; the alimentary canal becomes simplified, or may disappear altogether, the parasite living on the juices of its host, and absorbing them through the skin. So

also parasites obtaining protection from the tissues of their host lose heir instinctive protective properties.

Reproduction.—The reproduction of parasites offers many peculiarities, all of which are readily correlated with our generalisation. A creature rigidly adapted to a special environment fails if it does not reach that environment, and hence species most successful in reproduction are able to afford the largest number of misses to secure a few hits, and so maintain existence. High reproductive capacity is still more urgent when the parasites tend to bring to an end their own environment by killing their hosts.

The reproductive processes of animal parasites are equally exuberant, as in the case of fungi. In the first place hermaphroditism is very common, and the animals in many cases are capable of self-fertilisation. Pathogenic reproduction and various forms of vegetative budding are found in all stages of the history of animal parasites.

The prolificacy of many parasites is almost incredible. As Leuckart pointed out, a human tapeworm has an average life of two years, and produces in that time 1,500 proglottides, each containing between 50 and 60 thousand eggs, so that the single tapeworm has over 80,000,000 chances of successfully reproducing its kind.

The devices tor nourishing and protecting the eggs and embryos are numerous and elaborate, and many complex cases of larval-migration and complicated cases of heteroecism occur.

The physiological adaptations of parasites are notable, especially in cases where the hosts are warm-blooded. The parasites tend to become so specialised as to be peculiar to particular hosts. Ecto-parasites frequently differ from species to species of host, and the flea of one mammal, for instance, may rapidly die if transferred to another although similar host.

The larval and adult stages of endoparasites becomes similarly specialised, and although there are many cases in which the parasites that excite disease in one kind of animal are able to infect animals of different species, the general tendency is in the direction of absolute limitation of one parasite, and indeed one stage of one parasite, to one kind of host. The series of events seems to be a gradual progression from temporary or occasional parasitism to obligatory parasitism, and to a further restriction of the obligatory parasite to a particular kind of host.

The worthy studies and clinical cases recorded by that zealous practitioner Noel Pillers, F.R.C.V.S., of Liverpool, are worthy of due note. He grasps the importance of a study of what to the many requires patience and perseverance. To the scientist one potent fact is elicited by such recorded cases, that they are handed down to posterity as a legacy worthy of note, and give to their author

the distinction "of something attempted, something done." The study of Parasitism has always had a fascination for me, and research in connection with it is destined to play a great part in the future advance of medical science.

LITERATURE.

T. S. Cobbold (Entozoa: an Introduction to the Study of Helmintholog (1869). R. Leuckart (The Parasites of Man: Eng. trans. 1886).

Of more modern books: Ed. of L. G. Neumann's "Parasites and Parasitic Diseases of the Domesticated Animals." (By late Dr. Geo. Fleming, C.B.) Revised by Professor J. Macqueen, F.R.C.V.S., London.)

"Animals," and the English Ed. of Max Braun's "Animal Parasites of Man," are the most comprehensive.

Translations.

COCCIDIA IN THE INTESTINES—RED DYSENTERY OF CATTLE—OBSERVATIONS ON EIMERIA ZURNI-RIVOLTA.

BY PROFESSOR B. GALLI-VALERIO.

Of the Institute of Hygiene and Parasitology of the University of Lausanne.

In 1878 Zürn noted for the first time the presence of coccidia in the intestines and glands of a calf which died of acute intestinal inflammation, and the same year Rivolta considered these quite distinct from the coccidia of the rabbit, and gave them the name of Cystospermium zürni. Since this period this coccidium has been the subject of frequent investigations and notices, for it has acquired great prominence as the cause of a grave malady of cattle known under the names of hæmorrhagic enteritis, bloody flux, red diarrhœa, coccidian diarrhœa, enteritis coccidiosa bovis, dysenteria, coccidiosa bovum. As this affection, as I have seen it, presents all the characters of bacterian and amœbian dysentery of man it ought to be named *coccidian dysentery of cattle.* In fact, when examining the fæcal material of infected cattle one is impressed with the fact that this is a typical dysentery; liquid fæces streaked with blood, or bloody mucus, casts coming from the anus continuously just as in the dysentery of man.

It is to the credit of E. Zschokke to have first drawn attention to, and given an exact and complete description of the symptoms, and of the pathogenic agent of this malady, and his observations have been confirmed in Switzerland by Hess, Guillebeau, and Zŭblin. Coccidian dysentery has been observed in a great many countries, and to-day we know that it occurs in Switzerland, Germany, Denmark, Hungary, France, Italy, England, United States, Philippines, where it has been seen in buffaloes, in North, East, and West Africa. All observers agree that the causal and specific agent of the malady is the coccidium first noted by Zürn. Guillebeau gave coccidia to three young calves to eat, and noticed fever and diarrhœa in them after three weeks.

Authors differ in opinion as to whether the coccidium of the rabbit and the ox are identical or of different species. The majority seem to

take it for granted that they are identical. Degoix, Züblin, Hutyra, and Marek and Hartmann and Schilling believe that the coccidium of cattle (eimeria zurni) is distinct from that of the rabbit (eimeria stiedæ). In view of these contradictions as to the identity of the two coccidia it seems useful to review the question.

All observers who have personally studied the question agree that the causal agent presents itself in two forms—spherical and ovoid. Zürn notes this ; Zschokke says that the predominant form is spherical, the greatest diameter is 10 to 20 microns; the protoplasm in the greater number of examples is homogeneous, rather refractile, and surrounded by a membrane with a double contour. Guillebeau distinguishes two forms : a large ovoid and a small spherical. Cultivating them on blotting paper at 20° to 30° C. he established the formation of four spores each with two corpuscles and the rest of protoplasm. Degoix describes them as corpuscles of 18-25×12 microns ; Montgomery of 17×15 microns ; Storch from 14-25×12–18 microns. Züblin says that the majority of the coccidia present a spherical form of 12–15 microns in diameter with ovoid forms of 12–10×25–30, and more rarely 20×30-35 microns. The membrane has a double contour of 1 micron in thickness. The protoplasm fills up all the capsule or is collected in a ball. He considers these different forms as microgametes, macrogametes, and fecundated forms, but in the depths he has only seen oocysts in different stages of development. Müller describes coccidia as ovoid or round bodies of 12·27 microns, with a distinct membrane of double contour. The protoplasm is composed of fine granules with a few large grains. In some forms there is a micropyle, the protoplasm filling all the cavity. These forms represent recently-fertilised macrogametes. In the other forms the protoplasm commences to contract at the periphery, and in others it is collected in a ball. These latter forms are fertilised macrogametes in a state of already advanced reproduction.

On July 15th, 1917, the author had the opportunity of observing an outbreak of coccidian dysentery in heifers on one of the Gruyère Alps, at an altitude of 1,608 m. One had been so severely attacked that it was slaughtered some days previously. Microscopic examination of liquid hæmorrhagic material from these heifers revealed the presence of innumerable coccidiæ.

In one field of the microscope 100 to 150 coccidiæ could be counted. There were two forms of these : the one very abundant and spherical, and the other ovoid and rare. After giving the structure of these the author observes that coccidiæ left in dry fæces or in water only rarely sporulated, even after two to two and a half months. On the contrary, if left in fæces kept damp and in a thin layer to allow

of access of air (air being necessary to the development of coccidiæ and the eggs of helminths), or spread on filter paper placed on damp earth, the greater number sporulated in three, four, or five days.

As regards the identity of these coccidia with those of the rabbit, in the first place there are very important differences from a morphological point of view. Whilst the coccidia of cattle present mostly a spherical form, this shape is quite exceptional in coccidia of the rabbit where the ovoid form slightly flattened at one extremity is absolutely characteristic. This ovoid form is maintained even after fecundation, in such a way that the oocysts of the coccidia of rabbits have a distinctly oval form. It is quite the opposite with bovine coccidia, where ovoid forms, already rare, are completely replaced by absolutely spherical oocysts, much more analogous to the oocysts of E. falciformis than to those of E. stiedæ. A difference exists also in the form of the sporoblasts; pyriform in the case of E. stiedæ they are ovoid in coccidia of cattle. From the point of view of pathogenic action the two coccidia also differ greatly. Besides the fact that bovine coccidium, contrary to that of the rabbit, has no tendency to localise itself in the liver, it brings about a true dysentery, whilst the second only provokes diarrhœa. Another point on which Rivolta has dwelt is that the coccidiosis of rabbits is very widespread; sick rabbits or carriers of coccidia, are found in every farm and stable; bovine coccidia are relatively rare, localised in certain regions, and generally on high pasture, just where rabbits are not found. If one comes to consider the two coccidia as identical it is necessary, in this case, to think of disseminating by the hare rather than the rabbit. The hare, as I have shown (*Cent. für Bakt.*, 1908, p. 608) is frequently infected with E. stiedæ on the mountain. Experiments also controvert the identity of the two coccidia. In fact, whilst Guillebeau has been able to infect three calves with coccidia, he has never been able to infect rabbits with bovine coccidia. Moreover Zŭblin did not succeed in infecting rabbits. I have made an experiment on a young rabbit: I gave it large quantities of oocysts of bovine coccidia not only with the water and the food, but also introduced by a little indiarubber probang. The rabbit still lives without having shown any morbid symptoms, and without having passed any coccidia of bovine type in the fæces. All these facts are against the identity of the two forms. Coccidia of cattle have nothing to do with E. stiedæ. They constitute a species apart, which for reasons of priority ought to bear the name of *E. Zürni Rivolta*, the name of *Coccidium* (*Eimeria*) *bovis* proposed by Zŭblin being considered synonymous. The finding of *E. Zürni* in the fæces of cattle is easily accomplished by examination of fresh material with a magnifying power of 200 diameters. The examination of fresh material also serves well for the study of sporogony.

I have made some staining experiments which I give here. Some preparations on an object carrier dried in air, fixed with methyl alcohol and coloured sixteen hours with Böhmer's hœmatoxylin or thymol blue, show the coccidia with a clear contour with a brown or blue protoplasm on a brown or blue background. Same results on moist preparations fixed with Bouin's liquid. Some moist preparations fixed for half an hour in acid sublimate, washed with water and iodised alcohol and coloured for twenty-four hours in picro-carmine, show a rose-coloured envelope and yellow protoplasm. This last stain also acts very well on preparations fixed with methylic alcohol. Some moist preparations exposed for twenty-four hours to 1 per cent. osmic acid vapour show coccidia, with a brown envelope, yellowish protoplasm on a brownish yellow groundwork.

For the *prophylaxis* of coccidian dysentery of cattle it is necessary to use drugs possessing the greatest sterilising therapy, to effect rapid cure of the animal with complete disappearance of coccidia in the fæcal matter. Of all the drugs used up to now (creolin, lysol, resorcin, sodium hyposulphite, tannin, silver nitrate, sulphate of iron, alum) not one accomplishes this aim. It might be worth while, perhaps, to go to the trouble of trying atoxyl associated with sodium chloride, which, according to Ottolenghi and Pabis, causes E. stiedæ to disappear rapidly from the fæces of rabbits affected with coccidiosis. One might also try chlorhydrate of emetine as well as salvarsan, which give good results in amoebian dysentery of man. But even so there always remains the danger of spread by apparently healthy cattle carriers of coccidia, which, according to Müller, are in the proportion of 80 per cent. in certain districts. The destruction of coccidia outside the animal body and above all in stalls and sheds, is a difficult problem to solve. If it is true that in the mass of fæcal matter the coccidia do not sporulate, they do not die there, but if they come in contact with the air sporulation takes place.

It does not do to count on great cold for their destruction. I have established the fact that E. stiedæ contained in the excrement of rabbits exposed to the great frosts of the mountain, placed on agar at 20–22 degrees, sporulates wonderfully. The different antiseptics seem to me to have quite too little action on the coccidia contained in the fœcal material. Hutyra and Marek advise watering infected fæcal matter with a 3 per cent. solution of sulphuric acid. I have submitted some fæces containing E. zurni to the action of solutions of sulphuric acid 3 to 50 per cent. and to sulphuric acid itself. Even with 50 per cent. sulphuric acid there are forms which preserve their characters for three days. With sulphuric acid itself destruction is very rapid : in less than an hour all the coccidia present shrivel up to

a saucer shape. Sulphuric acid is therefore really an agent to be relied on to destroy coccidia. It is to be recollected that solutions of 40 to 50 per cent. associate the fact of the elevation of the temperature to 85–86° C. with the direct action of the acid. The multiplication of coccidia necessitates a certain degree of dampness in external surroundings; the drier a stable is the less easily can the coccidia sporulate. It is, perhaps, advisable to use powdered turf, sand or dry earth in cases occurring in stalls and sheds in order to absorb liquid matter whilst isolating the sick animals as quickly as possible.

The drainage of pastures and the suppression of pools on the edges of which the coccidia preserve themselves and sporulate also renders good service. The replacing of pool water by good potable water should contribute to render less frequent the coccidian dysentery of cattle. I myself have been convinced that running water can play a great part in the spread of the malady from one pasture to the other, carrying the coccidia on the pastures down the river or stream in just such a way as I have verified for bacterian dysentery of man.

The greatest danger, however, is in the stall itself, where the animals are infected one after the other, or where infection is maintained very probably from year to year because no energetic disinfection is carried out.

Conclusions.

1. Coccidian dysentery of cattle is due to a specific coccidium: Eimeria zurni Rivolta.
2. It is chiefly transmitted by ailing animals in stalls, stables, and sheds.
3. Infected abodes not disinfected or insufficiently disinfected maintain infection for ages.
4. For a good prophylaxis the following are necessary (*a*) a strong sterilising therapy of the sick animals associated with their isolation; (*b*) the destruction of their fæces and disinfection of the standing (sulphuric acid); (*c*) the draining of pastures and distribution of good potable water.—*Swiss Veterinary Journal.* G. M.

KANSAS STATE AGRICULTURAL COLLEGE 18 JUL 1918 LIBRARY

THE MERCURIAL COMPOUNDS IN THE TREATMENT OF EPIZOOTIC LYMPHANGITIS.*

By Professor GUIDO FINZI,
Royal Veterinary School, Turin.

In the month of January, 1916, we had the opportunity of trying a method of treatment for epizootic lymphangitis which has given us quite satisfactory results.

* Extract from the Proceedings of the Society of Foreign Pathology. Vol. X. Meeting of June 13, 1917. No. 6. Translated by Colonel F. Wilson, D.D.V.S., British Expeditionary Force, Italy.

We have had in our hospitals five horses affected with a very serious form of epizootic lymphangitis ; elongated-winding, branching cords, with numerous glands involved, with round swellings, in the course of which and between them have developed abscesses giving a discharge of pus streaked with blood in which the cryptococci were clearly visible.

One of the horses had severe lesions on the neck, the chest, and the anterior limbs ; another on the fore legs and side of chest, another on the side of chest, on the abdomen and hind limb ; and the last one on the neck and face, with bilateral ulcerations of the typical nature, which discharged characteristic creamy pus containing numerous cryptococci.

Malleinisation (intra palpebral reaction, and ophthalmic reaction connected with it) has given us absolutely negative results.

In the less serious cases Professor Pietro Ghisleni, Director of the Surgical Clinique of the Veterinary School at Turin, has first of all sought to obtain a cure with all the available surgical means. But the cases were already too far advanced, and far too serious to hope for a cure.

G. Gasperini* informs us that he cured a foal affected with an extreme form of epizootic lymphangitis by the use of bichloride of mercury "used as in syphilis." The fact is given "without other references."

Being well convinced of the specific curative action of mercury in the protozoid diseases and satisfied that the mercury supplies to their treatment an antiseptic material of great value and its compounds exercise a special therapeutic action particularly effective in a number of infectious diseases, we wished to experiment later to Gasperini, on the value of mercury and some of its compounds for the treatment of epizootic lymphangitis.

The formulas with which we have made the experiments are as follow :—

(*a*)	Salicylate of Mercury ..	6 grammes.
	Sterilised oil of vaseline ..	100 ,,
(*b*)	Calomel	5 grammes.
	Sterilised oil of vaseline ..	100 ,,
(*c*)	Bichloride of mercury ..	1 gramme.
	Sodium chloride	2 ,,
	Boiled distilled water ..	100 ,,

Knowing the results of treatment with mixtures in certain infectious

(*) Infective Diseases of Man and Animals, Vol. II, p. 1171. Ed. Vallardi, Milan. 1915.

diseases, in the end we have experimented with the formula (*d*) an arsenio mercuric mixture.

(*d*) Benzoate of Mercury	..	1 gramme.
Sodium Chloride ..	..	0·26 ,,
Acid Cacodylic ..	..	0·5 ,,
Boiled distilled water	..	100 ,,

Herewith are the results of the treatment which we carried out with the five horses entrusted to us.

Solution (*a*) By intra muscular injections.—First injection 10 cc. at an interval of 2 days; second injection, 10 cc. at three-day intervals; third injection, 20 cc. with three-day intervals; fourth injection, 30 cc. with three-day intervals; fifth injection, 40 cc. One should give five to seven more injections of the same dose at the same intervals.

Solution (*b*) By intra-muscular injections.—First injection, 5 cc. two-day intervals; second injection, 10 cc. three-day intervals; third injection, 15 cc., three-day intervals; fourth injection, 20. Six to eight injections should be given of each dose, each time increasing the dose by 5 cc. if there are no indications of intolerance.

Solution (*c*) By hypodermic or intra-muscular injections; the injections should be made according to the method previously given.

Solution (*d*) By injections hypodermic or intra-muscular. First injection, 20 cc., two-day. intervals; second injection, 20 cc., two-day intervals; third injection, 30 cc., three-days interval; fourth injection, 30 cc., three-day intervals; fifth injection, 40 cc. One should make five or seven more injections of the same dose, always at the same interval.

With this last formula two horses have been treated and cured.

Naturally the treatment with all mercurial preparations must be carried out with care. The individual susceptibilities are such, and the absorption is so often incomplete and delayed, that it requires careful supervision.

When one sees the symptoms of mercurialism the treatment should be completely suspended and oil purgatives given, the treatment being recommenced after eight or ten days, or when there is no appearance of albumen in the urine, if there has been kidney disturbance.

In one case only (salicylate of mercury) have we been obliged to suspend the treatment. In short, our animals after ten or twelve injections have been returned to the owner perfectly cured.

After three, five and six injections, the cords decrease considerably, become insensitive to pressure, and the initial sores cicatrise.

During the treatment one does not observe the appearance of new

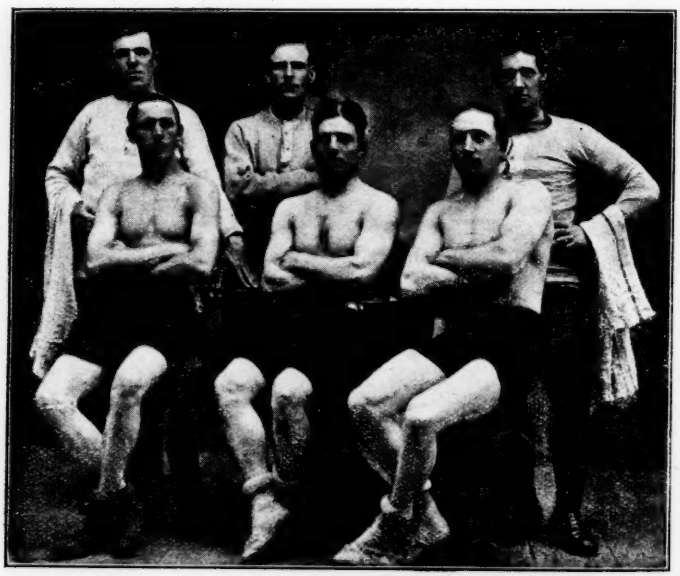
abscesses; meanwhile existing lesions become soft and burst spontaneously.

By our results we believe we are able to affirm that among the already known treatments for epizootic lymphangitis, the mercurial preparations are the best for effect and also from an economical aspect; with the injections of mercurial compositions we have obtained the complete cure of severe cases of epizootic lymphangitis, and up to to-day our horses are in the best of health and have shown no relapses.

According to our researches the formulæ (*c*) and (*d*) are those which give the quickest cure.

A BOXING COMPETITION "SOMEWHERE IN ITALY."

In the Army, as is well known, all sport plays a very important part in keeping the men "fit" and in condition, and wherever the Britisher goes one may rest assured that exhibitions of the "boxe" will be well to the fore. During the past month at a town "somewhere in Italy," where there are stationed a large number of men of the R.A.M.C., A.V.C., and A.S.C., a show of this kind was arranged for



R.A.M.C., A.V.C. and A.S.C.—A Group of Competitors in an International Boxing Contest, "Somewhere in Italy."

the benefit of the wounded men of both nations. By kind permission of the Municipality the ring was erected in the centre of the Opera House, a building which for arrangement and decoration would rival some of our best in England, and the crowded condition of the boxes and stalls—in fact, every part of the house—testified to the popularity of the entertainment. The names of one of the Chief Ministers of the Italian Government and some very high British Military authorities were in the list of patrons, and the Committee was composed of representatives of each nationality. The referee was a well-known R.A.M.C. Colonel; one judge, well known in the racing world at home, belonged to the Remounts, the other to the R.E. Service, and the time-keeper to the Army Veterinary Corps; whilst the master of ceremonies belonged to the Army Service Corps; so that the various services were well represented. Stewards and seconds were members of the R.A.M.C., A.V.C., and A.S.C., and there was a very large and appreciative audience of British and Italian soldiers, as well as a crowd of the residents in the town.

The enclosed photograph shows some of the British competitors, and the programme included contests between various corps' representatives, between British and Italians, and between the Italians themselves.

During an interval a musical programme was introduced, together with lantern slides of the war front in Macedonia. Italian masters of the science of fencing gave exhibition bouts in this very graceful exercise, their skill in attack and defence being much applauded.

Altogether it was a gathering of useful import in further cementing the *intesa* or *entente cordiale* feeling of good fellowship which has always existed between England and Italy.

Reviews.

WOUNDS OF ANIMALS AND THEIR TREATMENT. By R. Harrison Smythe, .M.R.C.V.S., pp. xii+194; 30 plates and figures in the text. Price 6s. nett. Published by Baillière. Tindall & Cox., Henrietta Street, Covent Garden, London, W.C.2.

Mr. Smythe has done the profession a service by publishing in so concise a manner a *resumé* of the latest methods upon which the treatments are based, and the work is particularly interesting just now to the young practitioner who has just "joined up" for active service with the Army.

It summarises in a very concise manner the various wound treatments, including general treatments and those best suited for special cases. Sir Almroth Wright's Opsonin Theory receives a chapter to itself, and the centre of the book deals with wounds of special parts

of the body, whilst other chapters are devoted to the wounds of war, to the use of vaccines in wound treatment, and to the beneficial effects of rational dietetics and hygiene. Well bound and of small compass, so that it can be easily carried about, the book is one which the veterinary officer on active service cannot well afford to be without if he wishes to keep himself up to date in this all-important branch of his professional duties.

REPORT OF THE TWENTY-FIRST ANNUAL MEETING OF THE UNITED STATES LIVE STOCK SANITARY ASSOCIATION—CHICAGO, DEC. 3, 4, 5, 1917.

This is the Report of the proceedings of an Association formed for the study of sanitary science, and the spread of information and methods pertaining to the control and eradication of infectious diseases amongst live-stock. The meetings are held annually, and good educative work is being done, the membership of the association comprising persons engaged in live-stock sanitary work for Federal State, Territorial, County, or Municipal Governments, or anybody interested in live-stock sanitation. From the list of subjects dealt with at this meeting, and the discussions which followed, the great value of exchange of ideas and opinions between professional men and those engaged in the care, management and breeding of live-stock may be estimated.

It was never so necessary to reduce in every possible way the animal losses from infectious diseases and other preventible causes. Meat, milk, and leather—animal derivatives and human necessities—were never so scarce and valuable. Housing, transport, and hygienic questions, all tending to improve and save animal life, need missioners in every district and locality. This Association is doing both mission and propaganda work.

The subjects dealt with and discussed include Bovine Tuberculosis, Plan for Branding Accredited Herds, Contagious Abortion in Cattle, Necrobacillosis in Swine, Hog Cholera Controls, Blackleg and its Prevention, Cleaning and Disinfecting of Stock Cars, Proposed Regulations for Accredited Herds. Committees have investigated some of these diseases and the problems connected with them, and the publication is a vast mine of experience in connection with some of these diseases. The difficulties surrounding their combating and control can hardly be understood by those who do not take an all-round view of the subject, such as is provided in this little work. Yet through all the problems and obscurity we can see how observant and trained men are grappling effectively with all obstacles, and working away to obtain healthy stock and the blessings of good sanitation. Perhaps nothing in the Report struck us so much as the case mentioned by Mr. Tuttle of 50 cows, eating and drinking out of a common manger, in which testing with tuberculin gave 11 per cent. of reactors. Six months afterwards—after partitions had been put between the cows, so that the cow in one partition could not get any feed or water from a neighbouring partition—the percentage of reactors was only 4. Each cow had an individual stall, and was kept there as long as she remained on the

farm. Any veterinarian who requires this Report, and it is really well worth reading, may obtain it through Dr. Campbell, 9, South Clinton Street, Chicago, U.S.A. G.M.

Correspondence.

THE EFFECT OF A SHELL FRIGHT.

To the Editor of THE VETERINARY JOURNAL.

DEAR SIR,—The following "case" will, I feel sure, be of interest to you, if you can find room to publish it. Black troop horse, in good condition. Standing close (say 50 yards) from one of the Canal d'Oise bridges, when the R.E. blew it up with gun cotton. Horse suddenly went apparently mad. Danced around, kicking at everything; put two men in hospital. Then gave loud screams and eyes became red and fiery; looked like a raving lunatic. After an hour of this behaviour, as no one could get near to it, we had it shot. It is the only case of real shell shock that I have heard of in horses.—Yours faithfully,

R. S. TIMMIS,

Major, Royal Canadian Dragoons.

(Author of "Modern Horse Management," etc., Cassell and Co.)

Personal.

DR. JOHN ROBBINS MOHLER succeeds the late Dr. Melvin as chief of the Bureau of Animal Industry. He has been in the service of the Bureau sinc e1897, and is a broad-minded, far-seeing, energetic man. He has translated a number of scientific works, and as a pathologist bacteriologist, and meat inspector, is right in the front rank. Under his guidance and direction the Bureau of Animal Industry will add fresh laurels to its reputation for good work done in all the fields and problems of animal disease.

Obituary.

THE LATE MR. JOHN HAMMOND, M.R.C.V.S.

THE death of Mr. John Hammond took place at Bale, Norfolk, on April 22nd last. The deceased gentleman, who was in his 89th year, had been ailing since Christmas, but the end came with rather unexpected suddenness.

As a veterinary surgeon he was well known throughout Norfolk, where he carried on a most extensive practice, which he only relinquished to his son on attaining the age of 70.

He was a man of unique personality, a champion of all that was right, with great determination and will power, and when convinced of the righteousness of a cause he would fight for it to the bitter end, for there was no turning back with John Hammond; yet withal he had a very tender and sympathetic heart, and was always ready to assist those in poverty or distress.

Overhanging the mantelpiece of his office was the text, "Whatsoever thy hand findeth to do, do it with all thy might." This may be accepted as the motto of his life, for in every detail of his various callings he was intensely thorough.

He was the oldest County Council Inspector in Norfolk, and during the cattle plague epidemic in the early sixties he took an active part in stamping out the disease. It is stated that he was the first veterinary surgeon in England to detect the existence of rinderpest in sheep.

The late Professor Simonds doubted the accuracy of his diagnosis until a special visit to Norfolk convinced him of the correctness of the report. Then followed a lengthy paper from the Professor, which contained no allusion to the work of John Hammond.

About 1892 Mr. Hammond was asked to give evidence in an interesting lawsuit—Pratt *v.* Harvey Mason. The red poll bull "Magiolina" had been purchased by Mr. Pratt from Mr. Mason's herd for 200 guineas. Subsequently it was stated the bull was impotent—hence the action. The case was tried at Birmingham, and the plaintiff had for his expert witnesses the late Sir George Brown, Professor J. Penberthy, and Mr. Taylor. They all stated that the bull was affected with paralysis of the erector penis muscles, and that he would be permanently impotent. For the defence Mr. Hammond said he considered the ailment was due solely to overfeeding, and insufficient exercise, and that with judicious treatment the bull would recover. With such formidable experts, of course, the case went against Mr. Mason—the bull was returned to him, and he made Mr. Hammond a present of the animal. The bull was turned outdoors and soiled, and ultimately served several cows. Many of his progeny were included in Mr. Hammond's dispersal sale. Mr. Hammond then wrote the three veterinary surgeons who gave evidence for Mr. Pratt, and Professor Penberthy's reply was rather amusing. "When the potency of your Norfolk air becomes known there will be a great influx of visitors to your coast."

In 1890 he came into conflict with the veterinary officers of the Board of Agriculture respecting the origin of an outbreak of bovine pleuro-pneumonia at Lord Leicester's. Every detail in connection

with this case was brought before the members of the Eastern Counties' Veterinary Medical Association, and a resolution was unanimously passed that the theory advanced by the veterinary officers of the Board was unsupported by the "facts and history" of the outbreak; but even this verdict did not go far enough for John Hammond, for a further report was published in the local press and in almost every agricultural paper in England. In addition to his veterinary practice he farmed extensively, and established one of the most noted herds of red polls in the country. The foundation stock was a cow named "Davy," presented to him by his father about 1850; and it is no exaggeration to say that the best red poll herds of the present day are infused with the "Davy" or "Davyson" blood.

As an exhibitor he was very successful at Smithfield, the Royal and County shows, and he had the honour of being presented by the then Duke of York with two oil-paintings of bullocks that had been purchased by the Duke from his herd and had won prizes at the London "Fat Stock Show."

In early life he distinguished himself as an athlete. He excelled in most of the games of the day, and had jumped 5 feet 9 ins. high. He was also a first-rate shot. He discharged various public offices, and for 55 years in succession was elected churchwarden at Bale. He had most pronounced religious convictions—was a Churchman of the Evangelical type, and had no sympathy with High Church forms and ceremonies.

Of the thirteen children of his marriage, five died in infancy. His second son, John, succeeded to the practice, and his youngest daughter is married to Mr. G. H. Gibbings, of Tavistock.

The funeral took place on April 26th,and was very largely attended, the little rural church at Field Dalling being insufficient to accommodate the numbers who had assembled to pay a last tribute of respect to one whom they all admired and many loved.

The profession has lost an honoured member, but the name of John Hammond will still live in the memory of those who enjoyed the privilege of being called "friends."

"So he passed over"—"And all the trumpets sounded for him on the other side." G.

ALEXANDRE FRANCOIS LIAUTARD, M.D., D.V.M.

THE world-renowned veterinary surgeon Alexandre François Liautard, M.D., D.V.M., died at his home at Bois Jerome (Eure) in France, on April 20, 1918, in his 84th year. He graduated from Alfort in 1856, and three years later went to America, and it was with

KANSAS STATE AGRICULTURAL COLLEGE 18 JUL 1918 LIBRARY

veterinary matters in this great continent that his life work was spent. He was one of the organisers of the Veterinary Medical Association of the U.S.A., and acted as its first secretary. He became Dean of the New York College of Veterinary Surgeons in 1860. In 1875 he organised the American Veterinary College and acted as Dean until it became amalgamated with the New York University in 1899.

Dr. Liautard's whole life was devoted to veterinary teaching, and as an anatomist and teacher and an illustrator of lectures by crayon drawings he has never been excelled. He edited the American *Veterinary Review* for over forty years, and was a prolific contributor to its pages. He was the author of many veterinary text-books. In 1884 he was decorated by the French Government as Chevalier du Mérite Agricole, and in 1880 he was elected one of the Honorary and Foreign Associates of the Royal College of Veterinary Surgeons.

The whole veterinary profession owes a great debt to Dr. Liautard for his sterling and pioneer work in connection with its establishment and advancement. A busy, active, intellectual, and broad-minded man, he was greatly loved and respected by all who had sat under him or who had met and known him. The gap caused by his loss is genuinely lamented, but there is great consolation that such a man lived for the veterinary profession and was spared for over sixty years to work well and vigorously in its establishment, uplifting and advancement.

DR. ALONZO DORUS MELVIN.

Dr. Alonzo Dorus Melvin, Chief of the Bureau of Animal Industry Department of Agriculture, U.S.A., died at Washington from pulmonary hæmorrhage on December 7.

Melvin was one of the veterinary stalwarts of America. He was ever progressive. He stamped out three outbreaks of foot and mouth disease; he eradicated the cattle fever tick in 51 per cent. of a great extent of Southern territory; livestock industry and meat inspection laws advocated by him were enacted by Congress during his term of office. In 1890 he came to Liverpool to inspect animals and vessels from the United States. He was the author of numerous works dealing with animal diseases and animal industry topics. He is survived by his widow, who was Miss Ella Harriman, of Bootle. He leaves a daughter, Marietta, and a son, Fordyce, who is a sergeant in the U.S.A. artillery.